INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

The Profitability of Contrarian and Momentum Strategies: Evidence from Emergent Markets

Hajar El Merbouh
Master Student, Department of Finance, Istanbul Commerce University, Turkey
Sıtkı Sönmezer
Associate Professor, Department of Finance, Istanbul Commerce University, Turkey

Abstract
The profitability of contrarian and momentum strategies has been the subject of numerous research studies. In this paper, we have evaluated the presence of the momentum and the contrarian strategies in the Brazilian and Istanbul stock exchanges and aim to assess which of the strategies is most profitable for the investors. This study is done to provide investors and the research area with updated, pertinent results and help the process of decision-making at different time horizons. A quantitative study following Jegadeesh and Titman's (1993) approach is employed. The study is conducted over two-time horizons: short- and long-term, 2 and 8 years, respectively. The findings of the empirical study have shown the effective existence of the momentum strategy and the contrarian strategy in selected Stock Markets. Also, the findings demonstrate that momentum strategies are ideal for generating a maximum positive return in the long term in BIST 100, while the contrarian strategies are more exhibited in the short term for BOVESPA and the long-term trend.

Keywords: *Abnormal return, momentum strategies, contrarian strategies, BIST 100, BOVESPA, winner/loser portfolio*

1. Introduction

The unexpected and dramatic events happening in the market cause people to overreact, which violates Baye's role, as proposed in experimental psychology by De Bondt and Thaler (1985). This behavioral bias and others, such as the non-repressiveness of predictions and the overconfidence in the precision of estimates, impact the decision-making process of investors and lead to irrational investment choices and sub-optimal risk management portfolios, Kahneman and Tversky (1977).

These irrational investment choices or decisions give rise to a gap between actual and expected gains, for which the resulting difference engenders excess or abnormal profits that investors seek to obtain. Several investment strategies have been considered to achieve this goal. Among the most common are contrarian and momentum strategies. Jegadeesh and Titman (1993) have reported that the presence of momentum strategies in stock prices can be observed in the intermediate term over one year by purchasing stocks that outperformed in the past (past winners) and selling stocks that have underperformed (past losers). Momentum strategies represent a unique and well-recognized investment style in global equity markets, and to justify the existence of momentum, an investigation took place trying to understand the fluctuations in stock prices and their relationship with the investors' underreaction to earnings-related information in the market; In contrast, De Bondt and Thaler (1985) have documented the apparent profitability of contrarian strategies. This approach assumes that the stock market overreacts to news events, provoking overvaluation, and undervaluation. Moreover, when the stock prices return to fundamental values, the investor who takes advantage of this inefficiency profits from Chan (1988). A contrarian strategy involves buying losers' stocks and selling winners' short stocks.

As a result, for a contrarian investor, reacting to the financial market's countercurrent is the best way to generate additional gains. This behavior defies the efficiency concept of financial markets (EMH). Stock prices are potentially unknown under this assumption. Hence, there would be no excess profit in the financial market. However, various research has been undertaken on this topic, and they have discovered that stock returns are linked to past performance, and hence future returns can be forecasted using past returns. Furthermore, several academics and practitioners have claimed that using contrarian tactics in the financial market can result in higher profits. However, in this discussion of contrarian tactics, the causes of these greater returns are the most contentious. These strategies have been the subject of several studies reviewing various exchange markets. However, relatively few studies on these strategies have been carried out in the context of emerging financial markets. The objective of this article is to assess the existence of contrarian and momentum strategies on the BOVESPA and the BIST100, as well as figure out the most profitable strategy for investors, i.e., which strategy provides significant returns to investors. This topic is important in finance academia because it studies the subject from the perspective that it exists a lack of studies that explains why in some markets, the contrarian profits are generated in the same investment horizons as the momentum strategies for other markets, which demands a

comparison study to trace if the phenomenon exists and why. In section 1, the article reviews the theoretical base of the overreaction and efficient market theories, the literature review of strategies studied, and the objectives of the study. In section 2, it describes the data, sample, and methodology and in section 3, it presents the main results and a discussion of the results.

2. Theoretical Base and Literature Review

To investigate the impacts of overreaction behavior on stock prices, De Bondt and Thaler (1985) studied the efficient market theory by performing an empirical test. To define the overreaction term, Kahneman et al. define the correct or normal reaction to news based on Bayes' rule violation prescription. The researchers stipulated that individuals frequently underweight earlier information and overestimate recent data. Another behavioral explanation is added to the behavioral research based on the "price ratio" hypothesis. Two scenarios could be right in this case:

- A company's equity with a high P/E ratio is regarded to have overvalued equity, which will eventually decline in value,
- In parallel, a company's equity with a low /E is regarded to have been undervalued after a series of bad earnings.

Then, price adjustments occur. According to Dreman (1982), the results of De Bondt and Thaler (1985) showed that every January of each year, losers' portfolios outperform better than winner portfolios which agree with the overreaction hypothesis predictions. From a dividend policy, Shiller (1979) assumed that aggregate price movements cannot be justified rationally by dividends but could be strongly correlated with changes in earnings in the coming future years, which leads to a pattern of overreaction. De Bondt and Thaler's (1985) purpose was to test the predictability of the overreaction hypothesis.

Eugene Fama (1991) focused on "Efficient Capital Markets: II" on establishing the evidence on the pricing adjustments to different kinds of information and trading costs. Also, Eugene Fama's 1991 aim is to describe security returns in terms of time series and cross-section behavior. Event studies provide the most conclusive evidence of efficiency. In the short horizon, the pre-1970 literature stipulates that the expected returns are constant through time, which means they are unpredictable from past returns, and the best way to predict these expected returns is by forecasting the historical mean. Early tests such as Fama (1965), Fisher (1966), and Lo and Mackinlay (1988) suggested evidence that the autocorrelations of daily and monthly returns are more positive for portfolios than those for individual stocks but statistically are ineffective. Recent results have confirmed that the variation of expected returns is a small part of returns variance.

In the short horizon, expected returns autocorrelations in the short horizon are positive and close to 0, while in the long term, returns have strong negative autocorrelation. Shiller-Summer (84-86), Fama and French (1988a), and Poterba- Summers (1988) studied the predictability of long-horizon returns and the results were similar in terms of getting a negative autocorrelation induced by price swings happening temporarily. In terms of market overreaction, DeBondt and Thaler (1985, 1987) assigned NYSE stocks and identified them as the most extreme losers or winners and extremely bad or good news about companies. Chan (1988) and Ball and Kothari (1989), Zarowin (1989) disagree with Debondt and Thaler, and they attributed these results to size effect failure to risk-adjust returns.

Eugene Fama (1991) interpreted volatility tests as not informative about the efficient market hypothesis since forecasted returns are constant and variation in stock prices is explained by shocks to expected dividends. After the 1970s, expected returns varied through time and may be explained by inflation rate variation, interest rates, and other variables. There are also articles documenting the seasonality effect as stock returns anomalies happen, especially on Mondays and in each January of every year and intraday returns. It is related to holidays and the size of companies (Ariel, 1990), in which the stock returns on average are much higher in January or on Mondays. In the pre-1970 literature, there were existing common models such as the random walk and martingale tests and the market model (event studies). Post-1970 literature, scholars consider testing efficiency based on asset-pricing models.

The Sharpe Lintner Black model has been considered by Eugene Fama's (1991) 'study. This model has found uncorrelations between portfolios and expected returns are equal risk-free interest rates (zero-beta, portfolios). The efficient market hypothesis and the SLB model seemed to be sufficient together in the 70s. Markowitz (1959) by implying two suggestions: Expected returns have a positive linear relationship with the market, and Beta is the only risk metric required to explain the cross-section of expected returns. The model has been considered false by Eugene Fama (1991). There is much evidence that shows the model anomalies, such as the marginal explanatory power of E/P on the expected returns, the stock's size (price times shares), leverage in tests that includes the market's beta, book-to-market equity Bhandari (1988), and Fama and French (1991).

In convergence with the market overreaction hypothesis, the contrarian investment strategy consists of buying losing stocks that tend to be undervalued and selling winners' stocks that tend to be overvalued. This means that it creates an opportunity of gaining excess returns when these stocks return to fundamental values. The model used to conduct Chan's1988 study was Sharpe-Lintner Capital Asset Pricing Model (CAPM), using a different approach than Fama and French (1986). The findings showed that the contrarian investment strategy earns small excess returns, economically insignificant, which is not defending the overreaction hypothesis. After a period of an abnormal loss or gain, betas increase or decrease consecutively depending on the situation. Jegadeesh and Titman 1993 stipulate that the profitability of contrarian and momentum strategies will exist if stock prices overreact or underreact to information. This required the study of the efficient market hypothesis by investigating the profitability of these strategies.

Two return-generating models are used to decompose the abnormal returns to allow identifying sources of these profits: The Simple One-Factor Model and the lead-lag model. The first model leads to understanding how systematic risk firm-specific returns contribute to earning relative strength profits only when the market is not efficient. The second

model is used to assess if the profits are earned due to a lead-lag relationship in stock prices (stocks overreact or underreact to the common factor, but the factor-mimicking portfolio returns are serially uncorrelated). The findings showed that buying winners and selling losers generated significant excess returns. The underreaction and the overreaction hypothesis are not necessarily conflicting but can be consistent (Carlos & Marhuenda, 2003). These two behavior patterns were behind studying the investor's behavior using models on capital markets. The study generally focused on two major points: comparing the results for three years with previous studies' results made for the same market and analyzing the effectiveness of the two strategies. The results have shown that positive contrarian returns were observed in both periods of 6 months and three-year period, but not statistically significant. Over the next five-year performance, Chopra & Al (2000) found that the worst-performing companies beat the best-performing stocks by 5-10% every year. These results are generated from the portfolios created based on previous portfolios' performance for a similar period.

The prevalence of the overreaction impact in the German market, according to Kulpmann (2002), is also a possibility. The researcher has shown that the prices of both struggling and performing equities witnessed a significant price reversal in performance after that. According to the author, the risk hypothesis does not account for the observed outcomes. This change in performance had historical grounds. The results of Wu and Li. (2011) support the overreaction theory seeing that long-term stocks in the UK stock exchange have shown these bouncing characteristics. The researchers demonstrated that a contrarian strategy is favorable for both low and mid-stock price levels.

Chaoqiong Shi (2011) recently researched the Chinese stock market from 2000 to 2010 to see if the contrarian and momentum strategies existed. The researcher was inspired by Jegedeesh and Titman's approach (1993). Weekly returns results were used to create the winner and loser portfolios. According to the findings, the momentum effect and the contrarian impact are both effective in boosting the Chinese stock market. However, when the momentum effect is compared to the contrarian effect, the contrarian effect is still quite significant. The Chinese stock market, once again, has a one-sided feature. This suggests that selling the losing portfolio lowers the return on the "buy the winning portfolio, sell the losing portfolio" trading approach. This proves that the contrarian method is the most profitable in this situation.

Coming to the Indian stock exchange, Ms. Anshu Singh (2018) investigated the occurrence of the contrarian and momentum effects in the market. The research listed the 50 stocks recorded on the Stock Exchange and their daily returns from January 2010 to December 2017. These stocks have been ranked based on their performance in either the losing or winning portfolios. The research is conducted over two-time horizons: short-term and long-term. Each of the short- and long-term periods has been divided into formation and holding periods. Therefore, the daily returns were determined for the two horizons during the test period. The findings of this study revealed that in many industries, the presence and profitability of contrarian and momentum strategies were found. They discovered that banking stocks, like those in the energy industry, had a momentum effect in the short term. As a result of the momentum strategy, these stocks continue to create positive abnormal returns. In the building, cement, fertilizers, media, and shipping sectors, Momentum is still more profitable than the contrarian method. The contrarian strategy, on the other hand, is more prevalent in the telecoms sector. Most winning stocks demonstrated a momentum effect throughout the short-term period, while the losing stocks showed a contrarian effect in the long-term period. On the other hand, almost all the stock losses in the metals and energy sectors displayed a contrarian effect, implying that the long-term strategy was implemented. This last outcome demonstrates the usefulness of the contrarian method in long-term cyclical companies when stock selections are based on sound company fundamentals.

Kaur (2014) investigated the association between industry type and the contrarian effect and/or momentum effect on the Indian stock market in a study. The research was conducted using a sample of 500 companies from the S&P CNX 500 index. The results demonstrated that contrarian strategies in this stock market are successful in the manufacturing and service industries, with the premium for these strategies being bigger in the manufacturing sector than in the service sector. Nabouk, M. (2020) and Faouzi & Driss (2018) recently employed ARIMA (Auto Regressive Moving Average) autocorrelation and regression tests in the Moroccan financial market to verify the predictability of returns and the application of the random walk model, respectively. Sifouh and Oubal (2018) investigated the oddity of the momentum impact in this market.

3. Objectives of the Study

The multiple studies conducted to investigate the existence of contrarian and momentum strategies on foreign stock markets encouraged us to explore the same question, but this time in two different environments:

- To assess the presence of contrarian and momentum effects in both markets BOVESPA and Borsa Istanbul.
- To determine the most profitable strategy for investors.

4. Data and Research Methodology

4.1. Sample Description

The data used in this paper is provided to us by the BOVESPA AND BORSA ISTANBUL Stock Exchanges. The database comprises monthly data for 65 Brazilian stocks and 79 Turkish stocks from the period of January 1, 2000, to December 31, 2022. BOVESPA AND BIST 100 indices were used as market indices. For each selected stock, we have the following data: opening price, closing price, and market capitalization. This enables us to verify the profitability of Momentum and contrarian strategies in the 2 markets. A quantitative method proposed by Jegadeesh and Titman 1993 was used in our empirical study. For each selected stock to be included in our work, companies must meet two criteria: Their year-end must be December 31, and Price information must be available throughout the holding period of the

portfolio. Indeed, 23 stocks not meeting these 2 criteria have been isolated, and 65 were selected in the BIST. Also, 21 stocks found not to meet the criteria have been eliminated and 79 were selected in the BIST. The entire study is divided into 2-time horizons: long-term and short-term. Stocks are categorized as winner or loser portfolios depending on their performances and formed in the formation period and tested in the holding period.

Time Horizon	Formation Period	Holding Period
Short term	01/01/2017 – 31/12/2017	01/01/2018 – 31/12/2018
Long term	01/01/2017 – 31/12/2019	01/01/2020 – 31/12/2022

Table 1

A loser portfolio refers to the group of stocks that performed the worst in the estimation. The portfolio with the best performance is known as the winning portfolio. The contrarian effect is verified if the time series of returns for contrarian portfolios turn out to be statistically positive. Conversely, there would be the momentum effect.

4.1.1. Hypotheses

The testing hypothesis of the four strategies is extracted from the theories following Jeegadesh and Titman 1993. Momentum:

- H1: The momentum strategy has a relationship with generating positive and significant returns in BIST 100 and BOVESPA.
- H2: The momentum strategy does not have a relationship with generating positive and significant returns in BIST 100 and BOVESPA.
- Contrarian:
- H3: The contrarian strategy has a relationship with generating positive and significant returns in BIST 100 and BOVESPA.
- H4: The contrarian strategy does not have a relationship with generating positive and significant returns in BIST 100 and BOVESPA.

5. Research Methodology

In this section, the equations used to arrive at strategies are presented.

5.1. Computation of Returns

Monthly returns of Brazil and Istanbul stock exchanges, along with the BOVESPA and BIST 100 indices, were grouped respectively to generate the annualized returns over the mentioned time horizons for better representation by using this formula:

$$Rpi = \frac{P1-P0}{P0} * 100 \quad (1)$$

This formula was used in most of the previous studies, such as Rafik & Syifa (2017) and Ms. Anshu Singh (2018). In equation (1), P1 indicates the price of the stock of the new month and P0 denotes the price of the previous month. Moreover, by using this equation, Rp remains the average monthly return, and indices were computed for the short- and long-term periods. Jalal Shah and Attaullah Shah 2018 and some scholars have used the log return formula to compute returns on stocks to generate the cumulative market-adjusted excess return:

$$Rj, t = \mathrm{LN}(\frac{Pf}{Pi}) \quad (2)$$

In equation (2), LN indicates the natural logarithm. Pf denotes the closing price and Pi is the new price. To standardize comparisons, all monthly returns for the periods from 01/01/2021 till 31/12/2022 and from 01/01/2017 till 31/12/2022 are annualized with the following formula used by Ms. Anshu Singh 2018:

$$Annualised\ returns = ((1 + monthly\ returns)\ ^12) - 1 \quad (3)$$

5.2. Computation of Beta

Beta measures the systematic investment risk; it shows the sensitivity of the stock to changes that happen in the stock markets. Ms. Anshu Singh (2018) reported that the market is assumed to maintain a beta of 1. If β equals 1, the stock responds simultaneously to market changes. If $\beta\ is\ lower\ than$ 1, the stocks react more slowly to the market movements. If $\beta\ is\ higher\ than$ 1, the stocks react more excessively to market changes. Therefore, Beta is deducted by comparing the stock trends and the market trend (index). The estimation of Beta can be based on regression analysis or the calculation of covariance and correlation as a method to analyze the relationship between two variables, A.S. Ramnarayanan and Ishita 2021.

The β coefficient can be computed as follows (Jeegadesh et al., 1993; Carlos & Marhuenda, 2003):

$$\hat{a} = \frac{\text{Covariance (Rp,Rm)}}{\text{Variance (Rm)}} \quad (4)$$

5.3. Computation of Abnormal Returns

To demonstrate the sensitivity of the abnormal returns and evaluate the presence of these strategies in the market, the Jeegadesh and Titman 1993 method is followed using a one-factor by deducting the difference between the realized returns and the expected returns.

The realized returns are calculated as follows in the equation above, equation (3). These returns are considered as an independent variable and the expected returns, which means that the abnormal return can be measured through these variables. This latter is supposed to be our dependent variable in the risk-adjusted Model.

To get the expected returns, we have employed the following equation, Ms. Anshu Singh 2018, Ramnarayanan & al 2021:

AR=Rp - (b *Rm) (5)

Where:

Ab: Excess returns (gains/losses),

Rp: Stocks return, and

Rm: Market return

Other scholars have calculated the expected returns differently by computing the accumulative abnormal return (CAR), De Bondt & Thaler 1985, Rafik & Syifa 2017 Jalal Shah and Attaullah Shah 2018. The accumulative abnormal returns are used to classify the stocks as winners and losers.

The (CARp, I,t) is calculated through:

$\text{CARp, i, t} = \sum_{T=1}^{t} ARp, i, t$ (6)

t:1,2,3……12 months, p: L, W

Where Arp denotes the abnormal return on a portfolio and CA Rp, i,t

$$CRp, i, t = \sum_{j=1}^{n} \left(\frac{1}{LN}\right) (Rj, i, t - Rm, i, t) \quad (7)$$

Where n is the number of stocks included in each portfolio.

6. Data Analysis and Discussions

6.1. Analysis of Short-Term Trends

There were two short-term phases, the formation period, which started from 01/01/2017 till 31/12/2017, and the holding period from 01/01/2018 till 31/12/2018. Abnormal returns were calculated through the formation period for each stock of the two markets. Positive abnormal returns are classified in the winner stocks portfolio and negative abnormal returns are categorized in the loser stocks portfolio.

In the holding period, momentum strategy is observed if the winning stocks continue to generate positive abnormal returns in this period and loser stocks continue to generate negative abnormal returns. A contrarian strategy is observed if the winner or loser stocks change the sign in the holding period.

Stocks	Abnormal Gain/Loss		Investment Strategy	Stocks	Abnormal Gain/Loss		Investment Strategy
	Formation	Holding			Formation	Holding	
	Winner				Winner		
AGHOL	2.12%	-0.37%	Contrarian	KCHOL	0.63%	-1.33%	Contrarian
AKFGY	15.60%	-2.11%	Contrarian	KORDS	5.00%	1.00%	Momentum
AKSA	6.32%	0.46%	Momentum	KOZAL	1.48%	15.00%	Momentum
AKSEN	8.59%	12.14%	Momentum	KOZAA	0.84%	5.44%	Momentum
ALGYOA	1.45%	7.74%	Momentum	NTHOL	4.95%	-1.15%	Contrarian
ALGYO	0.81%	0.50%	Momentum	PGSUS	1.10%	13.23%	Momentum
ALKIM	0.34%	1.29%	Momentum	PETKM	2.34%	0.87%	Momentum
ASUZU	4.33%	10.58%	Momentum	SASA	10.95%	5.83%	Momentum
ARCLK	2.57%	-2.93%	Contrarian	SELEC	4.29%	0.89%	Momentum
BAGFS	8.52%	0.10%	Momentum	TAVHL	3.43%	6.15%	Momentum
CIMSA	2.99%	1.55%	Momentum	TKFEN	1.44%	5.50%	Momentum
CCOLA	2.29%	4.88%	Momentum	THYAO	1.73%	8.40%	Momentum
DOAS	3.64%	7.17%	Momentum	TSPOR	9.91%	-3.23%	Contrarian
ENKAI	5.98%	3.27%	Momentum	TMSN	3.09%	10.59%	Momentum
ERBOS	8.94%	-1.61%	Contrarian	TUPRS	1.67%	3.65%	Momentum
EREGL	5.48%	-3.09%	Contrarian	TTKOM	1.52%	7.20%	Momentum
FROTO	4.63%	-1.15%	Contrarian	TTRAK	1.74%	6.29%	Momentum
HEKTS	8.61%	12.08%	Momentum	TOASO	6.53%	-2.48%	Contrarian
ISGYO	0.13%	9.19%	Momentum	TCELL	0.15%	-1.34%	Contrarian
JANTS	4.88%	6.22%	Momentum	VESTL	2.58%	-0.01%	Momentum
KARSN	1.06%	3.19%	Momentum	VESBE	4.41%	1.46%	Momentum
Loser Stocks				Loser Stocks			
AKBNK	-1.19%	-0.45%	Contrarian	IPEKE	-1.31%	0.20%	Contrarian
LBRK	-1.52%	5.95%	Contrarian	ISCTR	-1.51%	2.09%	Contrarian
ASELS	-0.42%	0.46%	Contrarian	ISFIN	-3.93%	1.29%	Contrarian
BERA	-5.33%	9.04%	Contrarian	KERVT	-4.43%	3.21%	Contrarian
BIMAS	-1.12%	5.19%	Contrarian	MGROS	-2.28%	4.68%	Contrarian
BRYAT	-1.80%	1.19%	Contrarian	ODAS	-6.36%	17.38%	Contrarian
BUCIM	-2.54%	5.70%	Contrarian	OTKAR	-0.03%	1.75%	Momentum
CEMTS	-0.41%	1.69%	Contrarian	OYAKC	-2.31%	1.88%	Contrarian
DOHOL	-2.61%	2.12%	Contrarian	SAHOL	-0.25%	1.29%	Contrarian

EGEEN	-0.76%	5.25%	Contrarian	SKBNK	-5.46%	5.24%	Contrarian
ECILC	-1.41%	6.43%	Contrarian	TKNSA	-2.46%	11.31%	Contrarian
EKGYO	-0.21%	11.12%	Contrarian	TSKB	-3.46%	4.06%	Contrarian
FENER	-0.09%	7.30%	Contrarian	TUKAS	-3.42%	7.07%	Contrarian
GARAN	-1.24%	-3.04%	Momentum	TURSG	-3.04%	1.93%	Contrarian
GLYHO	-5.74%	5.47%	Contrarian	ULKER	-3.16%	4.48%	Contrarian
GSDHO	-0.29%	-0.62%	Momentum	VAKBN	-3.26%	5.94%	Contrarian
GUBRF	-1.67%	3.21%	Contrarian	YKBNK	-1.23%	-0.19%	Momentum
HALKB	-2.60%	6.03%	Contrarian	ZOREN	-5.40%	5.02%	Contrarian

Table 2: The Short-Term Trend of the 79 Stocks of the Borsa Istanbul Market Under Study
Source: Excel

By analyzing the short-term trends, it was found that a total of 43 winner stocks and 36 loser stocks. As for us, 31 out of 43 winning stocks have presented a momentum effect, while only 12 of the rest have shown a contrarian effect. The momentum effect is more visible in some sectors, such as the acrylic chemical industry, the automotive sector, and the engine and tractor industry, where respectively AKSA, ASUZU, and TMSN have delivered in the formation period positive abnormal returns. Significant abnormal returns are visible in the real estate sector, the polyester industry, and the commerce industry in 3 stocks, namely: AKFGY, SASA, and HEKTS. AKSEN from the energy sector and HEKTS from the commerce industry have continued with their momentum effect. AKFGY from the real estate sector has changed to a loser stock in the holding period, and TCELL from the communication services sector and other stocks from different industries.

Out of the 36 loser stocks, only 4 stocks have exhibited a momentum effect, while 32 of the rest of the stocks have shown a contrarian effect. In the banking sector, mixed results have been seen. YKBNK and GARAN have been displaying a momentum effect. Though, AKBANK shows a contrarian effect. As a result, investors should base their investment decisions on relevant research and exercise extreme caution while purchasing these stocks. Moreover, understanding how these industries have performed over the past two years is useful.

Stocks	**Abnormal Gain/Loss**		**Investment Strategy**	**Stocks**	**Abnormal Gain/Loss**		**Investment Strategy**
	Formation	**Holding**			**Formation**	**Holding**	
	Winner				**Winner**		
ALPA4	-0.19%	-6.32%	Contrarian	ITUB4	0.05%	2.25%	Momentum
ABEV3	0.57%	-0.39%	Momentum	KLBN11	0.00%	-1.32%	Contrarian
ARZZ3	1.45%	0.86%	Momentum	LREN3	5.38%	0.00%	Momentum
BRAP4	0.85%	2.36%	Momentum	MULT3	2.75%	1.78%	Momentum
BEEF	0.49%	2.69%	Momentum	NTCO3	1.82%	-5.38%	Contrarian
BRKM5	0.39%	-6.00%	Contrarian	PETR3	3.90%	2.93%	Momentum
ELET3	0.00%	2.38%	Momentum	RAIL3	-0.37%	2.12%	Momentum
COGN3	1.70%	0.14%	Momentum	SANB11	2.71%	0.47%	Momentum
CVCB3	0.28%	-6.81%	Contrarian	SBSP3	5.14%	3.53%	Momentum
DXCO3	9.95%	-5.05%	Contrarian	SMTO3	2.02%	-1.24%	Contrarian
ECOR3	1.11%	-3.20%	Contrarian	SLCE3	-0.30%	2.01%	Momentum
EMBR3	-0.09%	-3.77%	Contrarian	TAEE11	0.42%	0.55%	Momentum
ENBR3	1.29%	0.94%	Momentum	TIMS3	0.00%	-0.09%	Momentum
ENGI11	-0.31%	0.61%	Momentum	TOTS3	1.95%	0.35%	Momentum
ENEV3	0.35%	-1.14%	Contrarian	UGPA3	0.72%	0.00%	Momentum
EZTC3	2.04%	-2.12%	Contrarian	USIM5	0.00%	-5.34%	Contrarian
FLRY3	2.18%	-0.46%	Momentum	VALE3	1.03%	2.46%	Momentum
ITSA 4	5.06%	1.12%	Momentum	YDUQ3	1.79%	-4.67%	Contrarian
Loser Stocks				**Loser Stocks**			
ALSO3	-1.81%	-1.37%	Momentum	EQTL3	-2.85%	1.96%	Contrarian
B3SA3	-4.37%	2.56%	Contrarian	GOAU4	-2.48%	2.36%	Contrarian
BBSE3	-2.42%	4.93%	Contrarian	GGBR4	-1.08%	1.88%	Contrarian
BBDC3	-1.90%	-0.01%	Contrarian	GOLL4	-1.40%	-5.70%	Momentum
BBDC4	-1.44%	-0.29%	Contrarian	HYPE3	-1.44%	4.50%	Contrarian
BBAS3	-1.42%	2.59%	Contrarian	JBSS3	-1.78%	-4.03%	Momentum
ELET6	-0.83%	2.94%	Contrarian	RENT3	-9.17%	0.70%	Contrarian
BRFS3	-3.32%	0.00%	Contrarian	MGLU3	-3.04%	-4.66%	Momentum
CCRO3	-4.75%	-0.12%	Contrarian	MRFG3	-1.21%	-5.83%	Momentum
CPLE6	-2.09%	2.71%	Contrarian	MRVE3	-5.23%	-2.31%	Momentum
CSAN3	-4.32%	-1.32%	Momentum	PETR4	-1.82%	2.69%	Contrarian
CYRE3	-4.71%	-0.16%	Contrarian	PRIO3	-2.10%	5.73%	Contrarian
CMIG4	-0.71%	1.86%	Contrarian	VIIA3	-3.33%	0.00%	Contrarian
EGIE3	-5.45%	0.47%	Contrarian	VIVT 3	-7.25%	-1.45%	Momentum

Table 3: The Short-Term Trend of the 65 Stocks of the BOVESPA Market Under Study
Source: Excel

By analyzing the short-term trends, a total of 50 winner stocks and 28 loser stocks were found. As for us, 23 out of 36 winning stocks have presented a momentum effect, while only 13 of the rest have shown a contrarian effect. The

momentum effect is more visible in some sectors, such as the energy sector, the academic and educational services, and the tech sector, where respectively PETR3, YDUQ3, and TOTS3 have delivered in the formation period positive abnormal returns. Significant abnormal returns are visible in the banking sector, the retail sector, and the raw materials industry in 3 stocks, namely: DXCO3, LREN3, and ITSA4. PETR3 from the energy sector and TOTS3 from the tech industry have continued with their momentum effect. DXCO3 from the raw materials industry has changed to a loser stock in the holding period and YDUQ3 from the academic and educational services sector and other stocks from different industries.

Out of the 28 loser stocks, only 8 stocks have exhibited a momentum effect, while 20 of the rest of the stocks have shown a contrarian effect. In the Energy sector, mixed results have been seen. CSAN3 has been displaying a momentum effect. However, EGIE3 shows a contrarian effect.

Comparing the short-term trends of the two markets is observed that the momentum effect is more visible in the winning stocks portfolio, and the contrarian effect is more present in the loser portfolio. To analyze which strategy is more profitable in these markets, long-term trends have also been analyzed in the section below.

6.2. Analysis of Long-Term Trends

There were two long-term phases, the formation period, which started from 01/01/2017 till 31/12/2019, and the holding period from 01/01/2020 till 31/12/2022.

Stocks	Abnormal Gain/Loss		Investment Strategy	Stocks	Abnormal Gain/Loss		Investment Strategy
	Formation	Holding			Formation	Holding	
	Winner				Winner		
AKFGY	0.92%	-8.18%	Contrarian	KARSN	0.82%	60.52%	Momentum
AKSA	0.38%	0.27%	Momentum	KRDMD	1.42%	16.02%	Momentum
AKSEN	0.29%	32.98%	Momentum	KERVT	1.15%	-3.74%	Contrarian
ALGYO	1.56%	-3.09%	Contrarian	KCHOL	0.47%	-4.11%	Contrarian
ALKIM	1.01%	26.25%	Momentum	KORDS	2.34%	37.83%	Momentum
ASUZU	1.01%	13.45%	Momentum	KOZAL	2.68%	19.48%	Momentum
ARCLK	0.24%	8.79%	Momentum	KOZAA	3.53%	-0.14%	Contrarian
ASELS	2.63%	-4.99%	Contrarian	ODAS	1.68%	-2.75%	Contrarian
BERA	0.16%	-1.27%	Contrarian	OTKAR	1.01%	23.33%	Momentum
BIMAS	1.37%	-2.11%	Contrarian	OYAKC	0.07%	-6.09%	Contrarian
BRYAT	2.01%	0.66%	Momentum	PETKM	2.08%	0.60%	Momentum
BUCIM	0.31%	-1.06%	Contrarian	SASA	6.14%	26.80%	Momentum
CEMTS	2.98%	3.99%	Momentum	SELEC	1.40%	-5.15%	Contrarian
DOHOL	0.79%	26.97%	Momentum	TAVHL	1.29%	1.10%	Momentum
EGEEN	3.73%	-4.92%	Contrarian	TKFEN	2.81%	10.51%	Momentum
ECILC	1.27%	7.42%	Momentum	THYAO	1.44%	-5.96%	Contrarian
ENKAI	0.30%	5.69%	Momentum	TSPOR	0.42%	0.87%	Momentum
ERBOS	2.25%	17.21%	Momentum	TUKAS	1.16%	-3.10%	Contrarian
EREGL	2.31%	-3.69%	Contrarian	TMSN	0.43%	17.25%	Momentum
FROTO	1.39%	14.41%	Momentum	TUPRS	1.91%	-7.78%	Contrarian
GLYHO	1.61%	17.15%	Momentum	TOASO	0.28%	6.97%	Momentum
GSDHO	1.28%	-7.27%	Contrarian	TCELL	0.32%	-0.79%	Contrarian
GUBRF	0.13%	-15.56%	Contrarian	ULKER	0.18%	-1.89%	Contrarian
HEKTS	3.30%	41.58%	Momentum	VAKBN	0.13%	-7.92%	Contrarian
IPEKE	2.31%	-2.70%	Contrarian	VESTL	2.65%	24.63%	Momentum
ISFIN	5.39%	-2.61%	Contrarian	VESBE	3.61%	18.05%	Momentum
ISGYO	0.21%	-3.72%	Contrarian	ZOREN	1.12%	1.30%	Momentum
Stocks	**Abnormal Gain/Loss**		**Investment Strategy**	**Stocks**	**Abnormal Gain/Loss**		**Investment Strategy**
	Formation	**Holding**			**Formation**	**Holding**	
Loser Stocks				**Loser Stocks**			
AGHOL	-0.91%	3.26%	Contrarian	ISCTR	-0.14%	-12.04%	Momentum
AKBNK	-0.08%	-7.71%	Momentum	MGROS	-0.24%	3.31%	Contrarian
ALGYOA	-0.18%	14.23%	Contrarian	NTHOL	-0.78%	13.33%	Contrarian
ALBRK	-0.17%	8.87%	Contrarian	PGSUS	-0.21%	-5.29%	Momentum
BAGFS	-0.85%	39.40%	Contrarian	SAHOL	-0.56%	-7.89%	Momentum
CIMSA	-0.49%	24.60%	Contrarian	SKBNK	-0.54%	-3.06%	Momentum
CCOLA	-0.67%	12.30%	Contrarian	TKNSA	-1.87%	20.57%	Contrarian
DOAS	-0.13%	16.43%	Contrarian	TSKB	-0.30%	1.92%	Contrarian
EKGYO	-0.22%	12.69%	Contrarian	TTKOM	-0.37%	-7.42%	Momentum
FENER	-0.56%	28.60%	Contrarian	TTRAK	-0.48%	-3.50%	Momentum
GARAN	-0.01%	-9.93%	Momentum	TURSG	-0.17%	13.35%	Contrarian
HALKB	-0.67%	-5.27%	Momentum	YKBNK	-1.04%	-7.19%	Momentum

Table 4: The Long-Term Trend of the 79 Stocks of Borsa Istanbul Market Under Study
Source: Excel

A period of 22 years is considered for analyzing the long-term trends. A total of 50 winner stocks and 29 loser stocks were found. As regards, 30 out of 50 winning stocks have presented a momentum effect, while 20 of the rest have shown a contrarian effect. The momentum effect is more visible in some sectors, such as the entertainment services industry, the energy sector, and the raw materials industry, where respectively, FENER, IPEKE, and OYAKC have delivered in the formation period positive abnormal returns. Significant abnormal returns are visible in the construction sector, the raw materials industry, and the basic consumption products industry in 3 stocks, namely: ENKAI, GUBRF, and KERVT. All mentioned stocks have continued with their momentum effect.

Out of the 29 loser stocks, only 19 stocks have exhibited a momentum effect, while 9 of the rest of the stocks have shown a contrarian effect.

Stocks	Abnormal Gain/Loss		Investment Strategy	Stocks	Abnormal Gain/Loss		Investment Strategy
	Formation	Holding			Formation	Holding	
	Winner				Winner		
ALSO3	1.17%	0.38%	Momentum	CVCB3	3.01%	-1.81%	Contrarian
ALPA4	1.28%	3.56%	Momentum	CYRE3	0.93%	1.83%	Momentum
ABEV3	0.22%	0.70%	Momentum	DXCO3	0.83%	2.29%	Momentum
ARZZ3	1.77%	1.66%	Momentum	ECOR3	0.32%	0.25%	Momentum
B3SA3	2.19%	1.45%	Momentum	EMBR3	0.69%	1.55%	Momentum
BBSE3	0.98%	0.10%	Momentum	ENBR3	1.11%	1.62%	Momentum
BBDC3	1.67%	-0.17%	Contrarian	ENGI11	2.67%	0.86%	Momentum
BBDC4	2.10%	-0.07%	Contrarian	CMIG4	1.70%	1.34%	Momentum
BRAP4	2.16%	2.85%	Momentum	EGIE3	0.83%	1.01%	Momentum
BBAS3	2.54%	-0.26%	Contrarian	EQTL3	2.33%	1.74%	Momentum
BRKM5	2.51%	2.20%	Momentum	EZTC3	1.04%	0.94%	Momentum
ELET3	3.95%	2.31%	Momentum	FLRY3	2.12%	0.45%	Momentum
ELET6	3.29%	1.76%	Momentum	GOAU4	0.04%	2.83%	Momentum
CCRO3	0.02%	1.02%	Momentum	GGBR4	0.96%	2.89%	Momentum
COGN3	0.75%	-1.60%	Contrarian	GOLL4	3.84%	0.88%	Momentum
CPLE6	1.09%	3.33%	Momentum	HYPE3	1.50%	0.41%	Momentum
CSAN3	0.60%	3.55%	Momentum	ITSA 4	2.04%	0.13%	Momentum
LREN3	1.14%	-0.13%	Contrarian	ITUB4	2.14%	-0.17%	Contrarian
MGLU3	7.80%	1.68%	Momentum	JBSS3	1.16%	4.32%	Momentum
MRFG3	1.27%	5.35%	Momentum	KLBN11	0.92%	1.86%	Momentum
MRVE3	1.68%	1.08%	Momentum	RENT3	2.29%	2.76%	Momentum
MULT3	1.04%	0.07%	Momentum	SLCE3	2.03%	2.92%	Momentum
NTCO3	0.89%	1.47%	Momentum	TAEE11	1.70%	2.14%	Momentum
PETR3	1.93%	2.24%	Momentum	TIMS3	0.39%	1.00%	Momentum
PETR4	1.90%	2.10%	Momentum	TOTS3	0.00%	4.00%	Momentum
PRIO3	3.82%	9.31%	Momentum	USIM5	1.97%	2.79%	Momentum
RAIL3	1.71%	-0.34%	Contrarian	VALE3	1.73%	2.19%	Momentum
SANB11	3.08%	0.19%	Momentum	VIIA3	0.15%	0.00%	Momentum
SBSP3	0.97%	1.71%	Momentum	VIVT 3	0.86%	1.18%	Momentum
SMTO3	1.60%	2.95%	Momentum	YDUQ3	1.55%	1.48%	Momentum
Stocks	**Abnormal Gain/Loss**		**Investment strategy**	**Stocks**	**Abnormal Gain/Loss**		**Investment Strategy**
	Formation	**Holding**			**Formation**	**Holding**	
	Winner				**Winner**		
Loser Stocks				**Loser Stocks**			
BEEF	-0.83%	3.59%	Contrarian	ENEV3	-2.21%	3.97%	Contrarian
BRFS3	-0.43%	-1.80%	Momentum	UGPA3	-0.33%	0.00%	Contrarian
CIEL3	-0.53%	-2.39%	Momentum				

Table 5: The Long-Term Trend of the 65 Stocks of the BOVESPA Market Under Study
Source: Excel

A period of 22 years is considered for analyzing the long-term trends. A total of 60 winner stocks and 4 loser stocks were found. As regards, 53 out of 60 winning stocks have presented a momentum effect, while only 7 of the rest have shown a contrarian effect.

Out of the 5 loser stocks, there were 2 stocks which have exhibited a momentum effect. In the long run, the contrarian effect is observed in the BOVESPA market, while in the Borsa Istanbul market, the results are closer to those found in the short-term trends analysis. To know which strategy is profitable for each market and each period, the average abnormal return and the t-test are computed in the next section and the results are discussed.

6.3. t-tests Results

Similarly, to the empirical results on momentum strategies, our study shows that the average returns of the winner's portfolios are strongly positive in the holding period in the short term with a positive value of 3.35% with a t-statistic of (2.08). Moreover, the Average returns of the loser's portfolios are also positive, with a value of 4.19% with a t-statistic of (2.95).

	Short-Term		Long-Term	
Measure	Winner	Loser	Winner	Loser
Average Abnormal Return	3.35%	4.19%	7.67%	5.98%
t-test	2.08	2.95	2.80	1.67

Table 6: T-Test Results for Borsa Istanbul Market

This shows that the average momentum is negative with a value of -0.84 %, and that can demonstrate that the contrarian strategy is ideal for generating profitable returns and is due mainly to the buy of the winners and the sale of the losers. Also, an average abnormal return of 1.69 % is obtained in the long term. This suggests the presence of the momentum and contrarian effect for the selected time horizons.

Our result reinforced the previous works on the profitability of momentum strategies in short-term and long-term trends. Anshu Singh's (2018)' findings showed that most winning stocks demonstrated a momentum effect throughout the long term.

	Short-Term		Long-Term	
Measure	Winner	Loser	Winner	Loser
Average Abnormal Return	-0.77%	0.38%	1.60%	0.67%
t-test	-1.80	-0.15	2.01	0.12

Table 7: T-test Results for BOVESPA Market

Similarly, an average abnormal return of -1.15 % in the short term and -0.07%, in the long run, is observed. This suggests the presence of the contrarian effect for the selected time horizons.

Reviewing the hypotheses cited for this study, the first hypothesis and the H3 are accepted based on the t-test results. This means that there is a relationship between momentum and contrarian strategies and the positive returns generated in both BIST 100 and BOVESPA. H2 and H4 are rejected.

7. Conclusion

The study aims to highlight the presence of momentum and contrarian strategies in both the Brazilian and Borsa Istanbul stock exchanges and their profitability initially by explaining the effects observed in the financial markets psychologically in the literature review. The adoption of the psychological approach has allowed a better understanding of investor irrationality and overreaction. Results showed that stock prices can deviate from their fundamental values. This creates an opportunity to earn more by opting for the contrarian strategy or momentum strategy, depending on the length of time.

The gap between the realized and expected returns cannot last in the long term because the exchange markets make auto-corrections to the stock prices.

Our research aimed to examine if this type of investment strategy exists in the selected stock markets, and which is profitable for the investors. Several inferences can be made from the findings, the effective existence of these strategies in the selected stock markets has been noticed. The momentum strategies are ideal for generating a maximum positive return in the long term in BIST 100, while the contrarian strategy has a relationship with the positive and significant returns in BOVESPA in the long and short term. The varying performance of the momentum and the contrarian strategies in different time periods and the causes of this varying performance need to be studied in more emergent markets based on behavioral theories and tests.

8. References

i. Ariel, R. A. (1990). *High stock returns before holidays: Existence and evidence on possible causes*. *The Journal of Finance*, 45(5), 1611–1626.
ii. Bhandari, L. C. (1988). *Debt/equity ratio and expected common stock returns: Empirical evidence*. *The Journal of Finance*, 43(2), 507–528.
iii. Barberis, N., Shleifer, A., & Vishny, R. (1998). *A model of investor sentiment*. *Journal of Financial Economics*, 49(3), 307–343.
iv. Ball, R., & Kothari, S. P. (1989). *Nonstationary expected returns: Implications for tests of market efficiency and serial correlation in returns*. *Journal of Financial Economics*, 25(1), 51–74.
v. Chan, K. C. (1988). *On the contrarian investment strategy*. *Journal of Business*, 147–163.
vi. Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). *Investor psychology and security market under-and overreactions*. *The Journal of Finance*, 53(6), 1839–1885.
vii. De Bondt, W. F., & Thaler, R. (1985). *Does the stock market overreact? The Journal of Finance*, 40(3), 793–805.
viii. De Bondt, W. F., & Thaler, R. H. (1987). *Further evidence on investor overreaction and stock market seasonality*. *The Journal of Finance*, 42(3), 557–581.
ix. Forner, C., & Marhuenda, J. (2003). *Contrarian and momentum strategies in the Spanish stock market*. *European Financial Management*, 9(1), 67–88.
x. Fama, E. F. (1991). *Efficient capital markets: II*. *The Journal of Finance*, 46(5), 1575–1617.
xi. Fama, E. F. (1965). *The behavior of stock-market prices*. *The Journal of Business*, 38(1), 34–105.

xii. Hong, H., & Stein, J. C. (1999). *A unified theory of underreaction, momentum trading, and overreaction in asset markets*. *The Journal of Finance*, 54(6), 2143–2184.

xiii. Faouzi, B., & Driss, D. (2018). *Applicabilité Du Modèle De La Marche Aléatoire A La Bourse De Cas Markowitz, H. M. (1999). The early history of portfolio theory: 1600–1960*. *Financial Analysts Journal*, 55(4), 5–16.

xiv. Jegadeesh, N., & Titman, S. (1993). *Returns to buying winners and selling losers: Implications for stock market efficiency*. *The Journal of Finance*, 48(1), 65–91.

xv. Kahneman, D., & Tversky, A. (1977). *Intuitive prediction: Biases and corrective procedures*. *Decisions and Designs Inc Mclean Va*.

xvi. Kahneman, D., & Tversky, A. (1982). *The psychology of preferences*. *Scientific American*, 246(1), 160–173.

xvii. Kaur, M. (2014). *Contrarian Effect and Industry Type in the India Stock Market*. *Indian Journal of Research*, 3(5), 35–37.

xviii. Külpmann, M. (2002). *Stock market overreaction and fundamental valuation (theory and empirical evidence)*. *Lecture notes in economics and mathematical systems*.

xix. Lo, A. W., & MacKinlay, A. C. (1988). *Stock market prices do not follow random walks: Evidence from a simple specification test*. *The Review of Financial Studies*, 1(1), 41–66.

xx. Nabouk, M. (2020). *L'efficience du marché boursier marocain, ses handicaps structurels et ses conséquences*. *Revue Internationale des Sciences Juridiques, Economiques et Sociales*, 1(1).

xxi. Poterba, J. M., & summers, L. H. (1988). *Mean reversion in stock prices: Evidence and implications*. *Journal of Financial Economics*, 22(1), 27–59.

xxii. Shi, C. (2011). *Momentum and Contrarian Trading Strategies: Evidence from the Chinese stock market 2000–2010*.

xxiii. Shiller, R. J. (1979). *The volatility of long-term interest rates and expectations models of the term structure*. *Journal of Political Economy*, 87(6), 1190–1219.

xxiv. Singh, M. (2018). *Momentum and Contrarian Investment Strategies – A Study from NSE, India*.

xxv. Sifouh, K., & Oubal, M. (2018). *Irregularites sur le marché financier Marocain: De l'effet Momentum*. *Revue Marocaine de Recherche en Management et Marketing*, 10(2), 119–135.

xxvi. Wu, Y., & Li, Y. (2011). *Long-term return reversals—Value and growth or tax? UK evidence*. *Journal of International Financial Markets, Institutions, and Money*, 21(3), 347–368.

xxvii. Zarowin, P. (1989). *Does the stock market overreact to corporate earnings information? The Journal of Finance*, 44(5), 1385–1399.